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SEWERAGE PROJECT NUMBER C270687 DETROIT LAKES, MINNESOTA

Environmental Protection Agency
Chicago, Illinois

February 1973

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ENVIRONMENTAL IMPACT STATEMENT

FOR: Sewerage Project Number C270687
(Detroit Lakes, Minnesota)

Submitted by the City of Detroit Lakes, Minnesota
106 E. Holmes Street
Detroit Lakes, Minnesota 56501

BY: Construction Grants Branch
Division of Air and Water Programs
Region V
Federal Environmental Protection Agency
Chicago, Illinois 60606

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82

CONTENTS

SECTION	PAGE
LISTS OF TABLES AND MAPS	ii
SUMMARY	iii
THE TEXT OF THE ENVIRONMENTAL IMPACT STATEMENT	
DESCRIPTION OF THE PROJECT	1
Location of the Project	1
Reasons for Action	2
Objective of Evaluation	2
THE WASTEWATER MANAGEMENT PLAN	2
Existing System Components and Dimensions	4
Proposed System Components and Dimensions	10
Method A. Phosphorous Removal by Chemical Precipitation	11
Method B. Application to Soils by Spray Irrigation for Water Re-use	11
Method C. Groundwater Recharge with Infiltration Basins	15
SUMMARY OF RESEARCH AND DEVELOPMENT	16
Water Quality Monitoring	16
Performance of Treatment Components	17
Agriculture and Soils	17
Social, Economic, and Environmental Studies	18
PROBABLE IMPACT OF THE PROJECT ON THE ENVIRONMENT	19
THE WATER RESOURCE	19
Surface Water Impacts	19
Groundwater Impact	21
THE AIR RESOURCE	22
THE LAND RESOURCE	22
LIVING RESOURCE	23
PROBABLE ADVERSE ENVIRONMENTAL EFFECTS	23
SHORT AND LONG RANGE USES OF ENVIRONMENT	25
COMMITMENT OF RESOURCES	26
ALTERNATIVES CONSIDERED	27
PUBLIC OBJECTIONS TO THE PROJECT	29
CONCLUSIONS AND RECOMMENDATIONS	30
COMMENTARY ON DRAFT STATEMENT	57

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LIST OF TABLES

TABLE		PAGE
1	Statistics on Service Area	33
2A, 2B, & 2C	Water Quality Data at Various Stations of the Treatment System	37-39
3A, 3B, & 3C	Removal Efficiencies	40-42
Diagram # 1	Sewage Treatment Plant Flow Diagram	43
4	Soil Water Relationships	44
5A	Monthly Input and Output of Water	45
5B	Minimum and Maximum Flows to and from Lakes	46
5C	Elevation at Wells in the Vicinity of Detroit Lakes Airport	47
6A & 6B	Monthly Input and Output of Water to Lake St. Clair After Diversion	48-49
7	Data on Lakes	50

LIST OF MAPS

MAP		PAGE
1	Detroit Lakes - Location	51
2	The Pelican River Chain	52
3	Drainage Ditch No. 14 and Lake St. Clair	53
4	Irrigation and Infiltration Sites	54
5	Vicinity Map-Sampling Station and Wells	55
6	Vicinity Residents	56

FINAL - ENVIRONMENTAL IMPACT STATEMENT

Detroit Lakes, Minnesota

C270687
(Formerly WPC-Minn-687)

1. Date of Statement ..... February 9, 1973

2. Status of Environmental Statement ..... Final

3. List of Those from Whom Comments on Draft Environmental Impact Statement Have Been Requested:

Department of Housing and Urban Development
Department of Health, Education, and Welfare
U. S. Bureau of Sport Fisheries and Wildlife
U. S. Bureau of Outdoor Recreation
U. S. Army Corps of Engineers
U. S. Geological Survey
U. S. Soil Conservation Service
Senator Humphrey - Minn.
Senator Burdick - N. Dakota
Senator Mondale - Minn.
Office of Federal Activities (Washington EPA)
City of Detroit Lakes
Winston C. Larson & Associates, Consulting Engineers
Minnesota Pollution Control Agency
A-95 Clearinghouse Director
Minnesota Health Department
Federal Aviation Administration
Federal Highway Administration
Council on Environmental Quality
Office of Legislation (Washington EPA)
Office of Water Programs (Washington EPA)
U. S. Department of Commerce
Congressman Bob Selmer Bergland - Minn. District 7
Minnesota Department of Highways
Becker Soil & Water Conservation District
Clear Air - Clear Water Unlimited
Minnesota Environmental Control Citizens Association
Minnesota Department of Aeronautics
Minnesota Department of Natural Resources

4. Type of Action ..... Administrative

NARRATIVE

The following is a final Environmental Impact Statement for a sewage treatment works project involving both a construction grants application and a research and monitoring grant submitted by the City of Detroit Lakes, Minnesota. When completed, the project will add 1.4 MGD of phosphorous removal capacity to the existing sewage treatment plant and will serve the

Detroit Lakes area of Minnesota. The project will initially serve a population of 6,400 and by the design year of 1990 will serve an estimated 8,400 individuals. The project is designed to provide nutrient removal for wastes contributed to the existing secondary sewage treatment plant by the population of Detroit Lakes and a Swift and Company food processing plant.*

The purpose of the research conducted under a Federal Research and Monitoring grant is to determine the following conditions under controlled monitoring:

1. The physical and chemical character, and nutrient absorptive capacity of wastewater irrigation and infiltration area subsoil with good quality wastewater.
2. To determine the impact of seasonal weather variations on effectiveness of nutrient removal by cropping and harvesting.
3. To determine the impact on subsoil sorption and microbial degradation processes of soil saturation and attendant elimination of the aerobic soil zone.

It is recognized that there is the possibility of subsoil clogging, or other situations limiting continued irrigation-infiltration disposal at different application rates. However, it must also be recognized that nutrients must be returned to the soil in some manner or other, whether it is a byproduct

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* The total design flow is 1,400,000 gallons per day, and the total design BOD loading is 4,261 pounds per day. The total industrial and commercial design flow is 560,000 gallons per day, and the total industrial and commercial design BOD loading is 2,830 pounds per day. There are presently no industrial wastes being contributed which will interfere with the normal municipal treatment processes.

of chemical precipitation or applied by using the water as a carrier of nutrients. Studies carried out under the auspices of the research and monitoring grant will be carried out to determine satisfactory methods of application to accomplish the desired results.

An application for a Federal construction grant pursuant to Section 8 of the FWPCA as amended was submitted to the Regional office on February 29, 1972. All action toward award of a Federal grant was held in abeyance until the environmental matters, discussed in the text of the draft statement of July 13, 1972, were reviewed through the impact statement process. An environmental assessment was received with Detroit Lakes application, but the subsequent review of the assessment brought out the need for supplemental information in order to meet obligations under the National Environmental Policy Act of 1969. Although the City of Detroit Lakes is not located in an enforcement area per se, the need to provide a very high level of protection for one of Minnesota's most important natural resources, a prime recreation-use lake, was an important subject for consideration in the preparation of both the draft and final impact statements.

The project proposed by Detroit Lakes and approved by the Minnesota Water Pollution Agency, will consist of the construction of a combined three-process facility to reduce the amount of phosphorous conveyed to Lake Sallie via the Pelican River. Included in the construction are:

1. A chemical precipitation and sedimentation facility.
2. A spray irrigation facility.
3. A soil infiltration facility.

Also included is the conversion of Lake St. Clair into an effluent retention basin for storage of winter flows. Provision of a suitable storage

facility is necessitated because the severity of the City's winter will render the land disposal facilities inoperable for approximately six months of the year.

The main purpose of the project, as previously stated, is to eliminate the flow of a nutrient rich effluent into Lake Sallie in order to slow down and, perhaps, eventually reverse its rapid over fertilization, i.e., its eutrophication. It is further anticipated that the project will also retard the process of eutrophication in other nearby resort lakes which receive flows from Lake Sallie.

Project implementation will necessitate acquisition of a large amount of property for both the irrigation and ground water recharge sites, and will also involve the acquisition of Lake St. Clair and its surrounding shore line. As described in the text of this statement, the greatest impact on the environment will occur as a result of the conversion of Lake St. Clair to a storage basin. It is the opinion of the applicant, however, that it is better to sacrifice the small, extremely shallow Lake St. Clair with its marginal recreational potential, rather than continue to endanger the surrounding lakes whose recreational, aesthetic, and economic importance are invaluable to the Detroit Lakes area.

Based on a thorough review of the alternatives presented, this statement reflects the view that the Detroit Lakes Wastewater Management Plan is basically sound. Insofar as can be determined, the only anticipated significant adverse environmental impact arising from the project could result from the possible long term degradation of Lake St. Clair which would result from continued overenrichment by the addition of the high-nutrient effluent from the existing municipal sewage treatment plant. The beneficial environmental features of the plan principally centering around the opportunity for long term studies of

alternative nutrient removal techniques not available in other alternatives are considered of sufficient value, however, to override the potential for an adverse impact associated with possible eutrophication of Lake St. Clair. The project will significantly decrease the inflow of overenriching nutrients now polluting the resort lakes in the Pelican River Chain and will help to assure the continued use of these lakes as summer playgrounds.

DESCRIPTION OF PROJECT

Location of the Project

The City of Detroit Lakes is located in West central Minnesota, approximately 160 miles west of Duluth, Minnesota, in Becker County (see Map No. 1). The Detroit Lakes sewage treatment plant and the land to be acquired for the phosphorous removal facilities are located near the western edge of the Detroit Lakes corporate limits, and effluent presently flows into Lake St. Clair which, in turn, outlets into County Ditch 14. County Ditch No. 14 joins the Pelican River directly below the outlet of Detroit Lake. The Pelican River then flows through Muskrat Lake, Lake Sallie, Lake Melissa, Mill Lake, Pelican Lake, Fish Lake, Lake Lizzie, Prairie Lake, through the Village of Pelican Rapids, and thence southerly to enter the Otter Tail River near Fergus Falls. The Otter Tail River flows in a westerly direction and enters the Red River of the North near Breckenridge. The project is designed to provide service for the City of Detroit Lakes, which has a population of 6,400 (1970 census). A population of 8,400 is projected for the 1990 design year of the project. In addition to the municipal wastes, the project will treat industrial wastes from Swift and Company, a poultry processor (see Table No. 1).[1] Detroit Lakes is located in the Red River drainage basin of Western Minnesota.

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1. Environmental Assessment Report for Detroit Lakes, Minnesota.

Reasons for Action

Lake Sallie is the first recreational lake down stream from the City of Detroit Lakes' sewage treatment plant in the Pelican river chain (see Map No. 2). Since 1948, the summer and permanent residents around Lake Sallie have experienced the occurence of severe algal blooms in Lake Sallie. After extensive research, it was determined that the blooms were being caused by the addition of overenriching amounts of nutrients--by far, the largest single source of these nutrients being the effluent from the Detroit Lakes sewage treatment plant. In order to protect Lake Sallie and the Lakes downstream in the Pelican River chain, it was decided that a method or methods of nutrient removal would have to be employed to abate overenrichment and subsequent eutrophication of the downstream lakes. Destruction of the resort lakes around the City of Detroit Lakes would deal a severe blow to the economy, aesthetics, and natural resources of the area.[2]

Objective of Evaluation

The purpose of this evaluation is to determine the impact of implementing the Detroit Lakes nutrient removal management plan--a plan which will provide nutrient removal from the effluent of Detroit Lakes sewage treatment plant up to the year 1990.

The Waste Water Management Plan

The Detroit Lakes waste water management plan includes the collection and treatment of municipal, commercial, and industrial wastewaters that

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2. Ibid. pp. 2-10.

are generated in the City of Detroit Lakes focusing on the Pelican River chain of lakes, Lake Sallie, Lake Melissa, Detroit Lake, et. al. Formulation of the plan was guided by three interrelated environmental principles:

- The environment is a single system with land, air, water, and living resources interacting and affecting and being affected by human activities.
- The environmental system, for planning purposes, is closed; nothing can be "thrown away."
- Some pollutants are potential resources out of place; if relocated in the environmental system, they may take on a new value.[3]

The plan contains a system which is made up of six basic components: 1. a collection and transport network; 2. treatment cells; 3. a storage basin; 4. irrigation facilities; 4. a "living filter" (the soil and organisms); and 6. a drainage network. Taken together, these components form a wastewater management system which utilizes wastewater constituents (water, phosphates, nitrates, potassium, organics) as resources to be applied through irrigation and ground water recharge to the land where they may be used as a soil conditioner or as nutrients. The harvesting of crops grown on the land results in the recycling of nutrients[4]--

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3. Muskegon Impact Statement. pp. 5.

4. "Evaluation Study on Removal of Plant Nutrients from Sewage Effluent By Induced Soil Percolation," by John R. Tilstra, Kenneth W. Malueg, and Winston C. Larson.

a potentially excellent solution to the pollution caused by nutrients. It should be noted that the City of Detroit Lakes has already implemented a large part of their wastewater management plan by providing excellent secondary treatment facilities to abate water pollution.

Existing System Components and Dimensions

The existing waste treatment facilities were enlarged with the aid of a Federal grant and placed in operation in 1963. The contract price for enlargement of the existing facilities was $389,695. The total project cost was approximately $450,000.

Past history of downstream nutrient fertilization of recreational lakes dictated that all available techniques and knowledge should be employed to reduce the organic loading and nutrient supply to these waters. Water quality standards at that time did not require nutrient removal, nor were there any known satisfactory methods to accomplish this treatment. The accepted standard at that time called for an effluent with a five-day BOD of less than 20 mg/l and suspended solids concentration of less than 30 mg/l. To accomplish this degree of treatment, a two-stage conventional plant, or some form of tertiary treatment would be required. Economics in construction and operation indicated that an aerated lagoon followed by a stabilization pond was the most satisfactory approach. It was the contention of the designers that the holding period provided by lagoons would assimilate the surges, and produce an effluent that would meet water quality standards at all times. The enlarged waste treatment

facilities were designed to treat 1,400,000 gpd* with a strength in terms of five-day BOD of 365 mg/l or a total of 4,621 pounds.

The treatment units that make up the existing sewerage works are as follows: (see Diagram No. 1)

A. The City is served by a separate sanitary sewer system.

B. Mechanically raked bar screen and grinder.

C. Pumping station.

Raw sewage is measured by a magnetic type flow meter. Grit removal is provided.

D. Primary sedimentation tank - circular tank--50 foot diameter with 7 foot side water depth.

Raw Sewage

Pump Capacity		Surface Settling Rate	Detention Time
GPM	GPD	Gals./Sq. Ft./Day	Hours & Minutes
750	1,080,000	550	2:17
1200	1,730,000	880	1:26
1700	2,450,000	1245	1:00
2000	2,880,000	1465	:51

E. Filters

The effluent from the primary sedimentation tank is split--being applied to two biological filters operating in parallel. BOD reduction in the primary sedimentation unit is 33%

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* gpd - gallons per day

at design flow leaving 2,847 pounds of five-day BOD to be applied to filters.

Filter No. 1--51 feet in diameter--6 feet of vitrified clay special media.

volume of media	-	12,258 cubic feet
area of filter	-	.04687 acres
application rate	-	200 gals./min. 288,000 gals./day 6.1 MG/acre/day
loading	-	570 pounds five-day BOD 46.5 pounds per 1000/cubic feet

Filter No. 2--

96 feet in diameter	-	8 feet rock media
volume of media	-	57,904 cubic feet
area of filter	-	0.17 acres
application rate	-	772 gals./min. at design flow 6.5 MG/acre/day at design flow
loading	-	2847 pounds five-day BOD 39.4 pounds per 1000/cubic feet

Application Rate at Various Pumping Rates

Pump Capacity G.P.M.	Flow to Filter No. 1	Flow to Filter No. 2	Application Rate to Filter No. 2 M.G./Acre/Day
750	200	550	4.8
1200	200	1000	8.7
1700	200	1500	13.1
2000	200	1800	15.7

F. Final Sedimentation Tank

Two tanks - each 20 feet wide X 60 feet long with sludge collecting mechanism. Seven foot side water depth (SWD).

Flow Through Rate at Various Pumping Rates

Pump Capacity G.P.M.	Flow G.P.D.	Surface Settling Rate Gals./Sq. Ft./Day	Detention Time Hours & Minutes
750	1,080,000	450	2:48
1200	1,730,000	720	1:45
1700	2,450,000	1020	1:14
2000	2,880,000	1200	1:03

G. Chlorination Tank

Two tanks in series - each 15 feet wide X 45 feel long. Side water depth, 8 feet.

Capacity - 81,000 gallons.

Detention time - 81 minutes at design flow.

Two turbine pumps then lift the effluent to an aerated lagoon.

1 pump ..... 750 Gals./Min.

1 pump ..... 1200 Gals./Min.

H. Aerated Lagoon

Pond size ..... 2.5 acres with 6 foot water depth

Dikes ..... 9 foot high

Dike top ..... 10 feet wide

Side slope 4:1

Retention period of 4 days at design flow.

Oxygen requirements based on flow of 1,400,000 gallons daily and a waste strength of 70 mg/l - five-day BOD.

Loading per day .... 817 pounds .... 5-day BOD

Loading per acre ... 230 pounds .... 5-day BOD

Oxygen Supplied		
2#/H.P./Hr.	3#/H.P./Hr.	4#/H.P./Hr.
720	1,080	1,440

I. Secondary Settling Lagoon

Pond size ..... 25 acres with 3 foot water depth

Dikes ..... 6 foot high

Dike top ..... 8 foot wide

Side slope 4:1

Retention period of 17 days at design flow.

Loading per day at design and 50% reduction in aerated lagoon ..... 408 pounds - 5-day BOD

Loading per acre ..... 16 pounds - 5-day BOD

J. Soil Adsorption System

Size of area ..... 20 acres

Type of soil ..... Organic Peat

Depth surface to ground water ... 2 to 4 feet

Application to surface by flooding

K. Digestors

Two digestors are provided. They are equipped with mixing mechanism and are heated. Digestor gas is used for fuel

and excess gas is burned in waste gas burner. Each digestor is 24'-6" in diameter with a vertical sidewall above the hoppers 24'-9" in height. The combined volume of the two tanks is 25,490 cubic feet.

An unheated sludge storage tank received treated sludge from the digestors. This tank is 30' X 34' with a SWD of 18 feet. The capacity is 18,330 cubic feet.

L. Sludge Disposal

Sludge is pumped to a sludge lagoon for storage and then removed for disposal on land. Some sludge is hauled wet for spreading on soils.

Statistics on the service area and operations at the waste treatment plant indicate that flows of 0.9 to 1.0 MGD will require treatment during the coming years. If the City and service area has normal growth during the next twenty years, it is conceivable that flows could reach 1.4 MGD by 1990 which is the design capacity of the existing facilities. As the strength of the waste is considerably less than that anticipated in design, there appears to be adequate reserve until 1990 insofar as the organic loading is concerned.

Proposed System Components and Dimensions

Lake St. Clair presently has a surface area of approximately 145 acres and is about four to five feet deep at its deepest spot. It appears nearly impossible to predict what the precise effect will be of increasing the surface area of Lake St. Clair when diversion of major flows is accomplished. Prior to construction of Drainage Ditch No. 14 (see Map No. 3), Lake St. Clair was supplied with water from Long Lake and surface drainage from its own basin. There was no outlet. The water level apparently remained static at about elevation 1340 as indicated by former shore line contours. The lake basin has been reduced to about one-half its former size, and the drainage area has also been reduced greatly. The land surrounding Lake St. Clair is accreted marshland not suitable for development. Evaporation, transpiration, and seepage losses may be sufficient to establish a balance with the input. Provisions will be made so that chemically treated wastewater can be added to Lake St. Clair if it should become necessary to maintain the water level during drought periods. Provisions will also be made to allow water from Long Lake or the diversion channel to enter Lake St. Clair if additional high quality water is required. It appears that with proper control of water level, and removal of a larger portion of the nutrients which now enter this lake, the conditions would not be altered, and would perhaps improve.

Since there is no way of predicting losses, the design of the treatment units is based on the assumption that any excess waters entering the lake will require nutrient removal. The facilities to accomplish this are those which would be constructed under Federal sewage works grant

C270687; they are designed as follows:

1. Method A. Phosphorous removal by chemical precipitation.

In order to treat one-third of the total flow of 693,000 GPD--230,000 GPD a plant would have to be designed to handle 160 GPM. It was recommended that a 200 GPM plant be used in order that the system would have some flexibility. Water from the stabilization pond will be pumped to the high rate solids contact unit, which incorporates within a single unified structure the processes of mixing, coagulation and flucculation, floc conditioning, liquid-solids separation, and automatic sludge removal. A slurry tank will contain the chemicals and feed them to the contact unit. The effluent from the contact tank will be gravity filtered. Chemical feed equipment for pH correction and chlorination will also be used. This equipment will reduce the total phosphate in the waste water from 30 mg/l (as PO_4) to .7 mg/l, a reduction of approximately 97%. Although plans are not yet finalized, it is anticipated that the sludges generated by this facility will be disposed of in an existing land fill.

2. Method B. Application to soils by spray irrigation for water re-use.

During a six-month period of the year, nutrient laden water can be used beneficially by certain crops to improve

their yield. In this instance, the water is available for the purpose, and through the application and re-use the water quality can be improved, and in so doing, make complete utilization of a natural resource.[5]

The proposed storage-irrigation treatment for phosphorous removal involves the use of Lake St. Clair as an effluent retention basin for two-thirds of the wastewater discharge. The effluent discharge from the existing waste treatment plant will continue to be channeled to Lake St. Clair where the water will be stored during winter months and then used for irrigation during the summer. The natural inlet of water into Lake St. Clair will be modified so as to bypass around Lake St. Clair, and natural outflow will be discontinued. The effluent discharge from the waste treatment plant under the proposed storage-irrigation phosphorous treatment will be identical to the present discharge into Lake St. Clair from the waste treatment plant. The water level of the lake is proposed to be raised a maximum of two feet for winter storage.

The Local Soil Conservation Service has studied the proposed irrigation and infiltration areas (see Map No. 4).

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5. Penn State Studies, Waste Water Renovation and Conservation," by by R. R. Porizek, L. T. Kardos, W. E. Sopper, E. A. Meyers, D. E. Davis, M. A. Farrell, J. B. Nesbitt, Pennsylvania State University.

Their studies show that the soils are sandy loams from 12 to 30 inches in depth, over stratified sands and fine gravel (Sioux and Arvilla, sandy loam). Table No. 4, supplied by the Local Soil Conservation Service, shows maximum permissible application rates. Infiltration studies show percolation rates to be 4 to 10 inches per hour in these soils. Detailed quantitative studies on the sodium and boron absoptive ratios of the soils are currently being conducted.

The surface soil of the spray irrigation and infiltration areas is 10 to 12 inches of dark colored sandy loam moderately high in organic matter. Beneath these soils are sandy loams and coarse loams to a depth of 30 inches. Sand and gravel lie below these depths.* The United States Geological Survey has done considerable research in the area. Mr. Thomas C. Winter, Assistant District Chief, was quoted as follows in a supplemental report to the original project environmental assessment:

"The groundwater drainage basin in the area of the proposed research is essentially the same as the surface water drainage basin. The groundwater system of concern is unconfined and, therefore, is a subdued image of the land surface configuration. Groundwater movement, therefore, in the areas to be used for spray irrigation and infiltration basins is generally toward

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* Insofar as can be determined, there are no significant faults, cracks, fissures. Direct flow (without adequate treatment) into the water table will most probably not occur.

the county drainage ditch that runs into Lake St. Clair. The special study we made last summer near Long Lake is very close to the lake and the entire area of research is east of that divide."

"Rate of groundwater movement is another matter. Until we obtain some data on acquifier characteristics and slope of the water table, it is difficult to estimate. I suppose it is not unreasonable to assume that it is in the neighborhood of several tens of feet per year."

The United States Geological Survey has installed wells in the proposed irrigation area to determine the groundwater gradient. Location of these wells is shone on map No. 5. The groundwater contours developed from this information indicate that the flow from the proposed irrigation area is in a south easterly direction toward the Lake St. Clair basin, which means the groundwater would return to the area now being used for the purpose of wastewater treatment, and consequently, could not effect any new areas in the event phosphorous removal was not complete. It is anticipated that an improvement will be shown in the phosphorous concentration of the groundwater in the Lake St. Clair basin. The nitrate concentrations of the water proposed to be used are acceptable at present and should be further reduced through irrigation practices.

3. Method C. Groundwater recharge with infiltration basins.

Where sufficient land is available and hydrogeologic conditions are favorable, an effective and economical way for removing phosphorous in wastewater is by groundwater recharge with infiltration basins. Movement of wastewater through the soil removes, or greatly reduces, suspended solids, BOD, microorganisms, phosphorous, fluorides, heavy metals, and other substances, including nitrogen if the recharge system is properly managed.[6] Based on all the information presently available to us, it appears that the hydrogeologic conditions at the proposed sites are favorable, and it appears unlikely that any municipal or private water supplies will be degraded.

It is planned to use vegetated basins,* an effluent with less than 10 mg/l suspended solids, inundation depths of 7 to 13 inches, inundation period of 2 weeks, and dry-up periods of about 10 days. An infiltration rate of 1 foot per day is anticipated with proper basin preparation. During the 180 day application period, the basins will be receiving water for 106 days, and remain dry for 75 days. During the 106 days, the accumulated infiltration rate would be 106 feet. To dispose of the proposed 587 acre feet of water, the floor area of the recharge basin should contain 6 acres.

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6. "Water Quality Aspects of Intermittent Systems Using Secondary Sewage Effluent," H. Bouiver, U.S. Water Conservation Laboratory, Phoenix, Arizona, Paper 8.

* Since these basins will be located on airport property, a request for an airport determination will be filed with the FAA Regional Air Traffic Division.

The daily flows to the basins would be 1,057,861 gallons, or at a rate of 735 gallons per minute. The daily rate would be equivalent to 3.26 acre-feet or 141,048 cubic feet. The minimum of 141,048 square feet of basin area would be required daily at the proposed infiltration rate. Six basins would be required, each to be 70 feet in width and 700 feet in length. This would permit inundation of 3 basins while the 3 remaining basins receive the dry-up period.*

The rate of inflow into each basin will be controlled with a hydrant, and measured with a triangular, critical-depth flume. It is proposed to use a water depth of 7 or 13 inches. In this way, a constant depth is maintained and the infiltration rate for each basin is determined from the difference between the inflow and outflow rate. Overflow from the outlet structure will be returned to the stabilization pond by gravity.

SUMMARY OF RESEARCH AND DEVELOPMENT

Water Quality Monitoring

A map entitled, "Vicinity Map--Sampling Station and Wells," (see Map No. 5) is provided showing sample collection and measurement sites, gaging stations, and groundwater monitoring wells. Sampling, collection, and measurement sites have been used for a three-year period in the collection

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* The dry-up period allows the soils to remain aerobic, which is essential for phosphate removal. In addition, the dry-up period will permit harvesting of the Reed Canary Grass and will also encourage higher evaporation rates.

of data. Gaging stations are read daily. Direct reading stations are checked weekly to determine the satisfactory operation of the recording equipment. Samples were obtained weekly at the stations from April 1 until September 30, 1971, and on a monthly basis (see Tables 5A-5C and 6A-6B).

The proposed project contemplates additional wells and chemical quality analysis by the United States Department of Interior, Geological Survey, to provide a close, continual monitoring of the groundwater characteristics.

Performance of Treatment Components

Monitoring of the existing sewage treatment plant has indicated that the BOD and SS removal has been high enough to keep the effluent within Minnesota water quality standards in every aspect except as regards nutrient levels. As can be seen by the 1971 monthly operating records (see Tables 2A-2C and 3A-3C), BOD removal has averaged over 97%. The same holds true for suspended solids and suspended volatile solids. The shortcoming of the sewage treatment plant, as indicated, has been the inability to remove nutrients. It is projected by the designing engineers that the proposed nutrient removal facilities will consistently remove at least 80% of the contained nutrients.

Agriculture and Soils

It is the purpose of this project to provide present and future nutrient budgets for the irrigation-infiltration-impoundment system, and to

trace the fate of BOD/COD, suspended solids, total solids, ammonia nitrate, and total nitrogen, ortho and total phosphorous any any potentially toxic metal, mineral, or organic wastewater constituents. It is proposed to obtain the present ground and surface water concentrations and mass flow with estimated removals from the system by grass crop harvesting.

Harvested crops from irrigation and infiltration areas will be disposed of by spreading and plowing under as is done in farming practice known as "summer fallow" to return humus to the soil; burning by special permit; or use as animal food. It must be kept in mind that matter is not destroyed, and can only be dispersed in a manner that will not create a problem to other parts of our environment.

Social, Economic, and Environmental Studies

Public hearings and information sessions have been held to fully inform the public of the facts concerning the project. Public concerns raised as a result of the project have been:

1. Concern over obtaining a fair price for site property acquired by the City of Detroit Lakes.
2. Concern or lack of understanding of the groundwater system and the phosphorous content of the storage-irrigation water prior to its reentry into the groundwater.
3. Concern about the quality of the wastewater being discharged into Lake St. Clair.
4. Concern that the plans as proposed by Detroit Lakes would not work as stated in the prospectus.

Land acquisition requires a review by qualified appraisers and a report to the City's governing body. Negotiations are then attempted on the basis of the appraiser's report. All site acquisition will conform with the policies set forth in the Uniform Relocation and Real Property Acquisition Policies Act of 1971 (P.L. 91-646).

There are no residences located on Lake St. Clair (see Map No. 6). It is surrounded by agricultural land and no relocation will be necessary. No appreciable change in the area can be foreseen. Lake use and surrounding land use will remain essentially the same.

Probable Impact of the Project on the Environment

The environmental impact of the Pelican River Watershed District's management plan can be grouped under four general headings: impacts on water, air, land, and living resources.

The Water Resource

The elements of the water resource component of the environmental system that are affected by the proposed action are the surface waters of the Pelican River Watershed in Becker and Ottertail counties and the groundwater.

Surface Water Impact

The most immediate surface water impact occuring as a result of the proposed project will be the substantial reduction of nutrients entering the lakes of the Pelican River Watershed District. The three-year research and demonstration grant has established a nutrient budget for the lakes under study. The Pelican River bearing treated wastewater from the City

of Detroit Lakes, introduced 22,050 pounds of phosphorous into Lake Sallie during the water year 1968-69, and 15,435 pounds in the water year 1969-70. Outflow from the lake removed 13,230 pounds of phosphorous in 1968-69 and 5,535 pounds in 1969-70, leaving a residual of more than 9,000 pounds of phosphorous coming from the Detroit Lakes wastewater treatment system each water year. In 1969-70, weed and fish harvest removed 221.4 and 892 pounds of phosphorous respectively. Since the residual of 9,000 pounds of phosphorous is not reduced significantly by the removal of weeds and fish, the decision to remove the phosphorous at its source appears sound. Implementation of this decision should improve, or at least preserve the lakes' current utility as prime recreational areas.

The proposed project[7] will be confined to the Pelican River Watershed, therefore, no significant extra-basin impacts are anticipated. Since the discharges from the proposed facilities exclusively will be to the sub-watershed that contains the existing waste treatment facilities, any additional treatment should not further decrease the quality of water, but rather improve upon existing conditions.

Although actual forecasts are extremely difficult to make in these matters, it is our opinion that the conversion of Lake St. Clair to a winter flow retention basin will have no immediate significant adverse impact. The high quality effluent that will be discharged into Lake St.

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7. Report by Charles R. Collier, District Chief, U. S. Geological Survey.

Clair will closely match the water already contained in the lake. The foregoing notwithstanding, it is recognized that over a period of time certain adverse impacts upon this body of water could well make themselves known. Among the possible adverse impacts that could possibly occur are unsightly algal blooms and unpleasant odors.

Overall, the reduction of nutrients discharged into the Pelican River Watershed should decrease the rampant algal blooms and rapid eutrophication in the recreational lakes that has been occurring over the last 20 years.

Groundwater Impact

A preliminary study[8] of the configuration of the water table in the area of the project indicates that the groundwater moves to the surface water bodies (ditches, streams, lakes) within the subwatershed which contains the existing wastewater treatment facilities. The only portion of the proposed treatment method that approaches the groundwater basin is the westerly plat of the spray irrigation site. Since this portion of the site is east of the groundwater divide that exists between Long Lake and County Ditch No. 14 leading to St. Clair Lake, any irrigation water that infiltrates to the groundwater should move to the ditch.

Groundwater flows generally south, and other than the portion of the table near the irrigation site, there should be no infiltration of treated wastewater into the groundwater system. Monitoring stations will keep close watch on all aspects of the groundwater characteristics to provide a safeguard for protection of the groundwater.

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8. Ibid.

The Air Resource

The present wastewater treatment facilities are not causing odor problems. Although it is anticipated that the proposed facilities will be virtually odor free, the utilization of Lake St. Clair as a retention basin may ultimately result in brief, mildly odorous episodes.

It is recognized that there is some possibility of spray being carried from the irrigation sites by wind currents. The prevailing winds flow in a southeasterly direction. The area surrounding the irrigation site is sparcely populated, and the nearest residence is approximately 1,000 feet from this site. The water to be used at this site is of very high quality. Tables 2A and 2B show that the coliform counts of the water are very low. Spray irrigation will be practiced only in the summer period when the concentration of oxygen in the water is at its highest, and the Environmental Protection Agency will insist upon good management techniques such that irrigation will not be carried out on excessively windy days.

The Land Resource

Land resource impacts of the project have a dual dimension--urban and rural. Improvements in the water quality of the lakes now affected by over enrichment will protect the recreational developments now existing adjacent to them which are dependent upon high water quality factors.

Rural land resource impact of the project is a major and direct objective of the project. The light soils, underlain with outwash gravel, lend themselves ideally to irrigation for increased yield of cropland.

The land to be used for the irrigation and recharge sites is now vacant and is located immediately south of the existing Detroit Lakes airport. Aesthetically, the addition of spray irrigation and recharge facilities and their accompanying buffer zones could be something of an improvement over the vacant scrub land.

Living Resources

The land contemplated for the irrigation site has marginal utility as a wildlife habitat. The addition of wooded buffer zones around the site should provide the existing population of game birds, song birds, and small mammals with adequate habitat areas.

Lake St. Clair, because of its shallow depths, freezes completely in the winter and, therefore, does not support fish life. The lake does have value, however, as a waterfowl and muskrat habitat. The relatively high quality water discharged into Lake St. Clair should not effect this use, at least immediately.

Probably Adverse Environmental Effects

The principal adverse environmental effects of the project encompass:

- The discharge of certain dissolved minerals (these include chloride, sulfates, and some nitrates) not removed by the system to those reaches of the Pelican River and the Chain of Lakes.
- The possibility of odor problems arising from severe algal blooms in Lake St. Clair and also the possibility of the creation of a mosquito breeding area in Lake St. Clair.

Certain minerals, sulfates, chlorides, and some of the nitrates received in the Detroit Lakes system will not be totally removed by the treatment provided. These materials will percolate through the soil system and subsequently will be intercepted by the drainage network and then discharged to the drainage ditch and eventually into the Pelican River Watershed. The concentration effect of these materials on the Pelican River is negligible. The effect on the drainage ditch and Lake St. Clair may be more significant, but the concentration levels are far below the levels that could lead to degradation of the waterways.

The irrigation and recharge sub-drainage systems will prevent these materials from migrating out of the site area and into the regional groundwater supplies. An extensive groundwater monitoring system, as previously discussed, will provide continuous hydrologic and water quality surveillance of the sub-drainage and local groundwater systems.

There is a possibility, because of the increased nutrient loads and the elimination of all natural inlets and outlets, that severe algal blooms and consequent odor problems will occur in Lake St. Clair during the spring and fall turnovers. The possibility of this seems slim, though, because of the high quality effluent to be stored in the lake, and because immediately upon thawing, water will be pumped from the lake to the groundwater recharge and spray irrigation sites.

The possibility also exists that the lake may become a nesting grounds for mosquitoes. This is also doubtful since upon spring thaw, the water will be interchanged by pumping to the spray irrigation and groundwater recharge sites. In addition, during preparation of final plans and specifications, consideration will be given to locating the inlet and outlet structures so as to encourage the maximum practicable degree of mixing.

Short and Long Range Uses of Environment

This project constitutes an attempt to save a series of highly developed recreational lakes which are a part of the Pelican River Watershed. These natural resources constitute the major industrial and commercial facilities of the area, that of tourism (see Table No. 7). Support for the project is based on its performance capabilities to facilitate realization of long range environmental goals, protection of the millions of dollars presently invested, and development opportunities of the region.

Immediately upon completion, the project will begin to arrest the process of eutrophication that is now taking place in the entire chain of lakes and especially in Lake Sallie. Recently, in an attempt to slow down eutrophication, a tremendous amount of weeds was harvested from Lake Sallie and spread on farm land and plowed under for their humus and fertilizing value. It was calculated, however, that the harvesting of a million pounds of weeds removed only about 400 pounds of nutrients. Fish (rough type--Bullheads, etc.) which are harvested from Lake Sallie are sold by the Department of Natural Resources for food. This work is accomplished by commercial fisheries and are disposed of on a National Scale. Project implementation will begin to alleviate the current weed problem in Lake Sallie. Over the long run, the project will probably also pave the way for the introduction of a more desirable game fish population in the lakes.

Based upon a review of all the information available to us, it appears that the only possible long range adverse impact arising from project implementation would be a potential inability to reclaim Lake St. Clair and the

irrigation sites, if this reclamation should become necessary in the future. The probability of requiring such a reclamation at any time in the foreseeable future appears to be quite low since project implementation may well improve the irrigation and ground water recharge sites from their existing minimal use conditions, and the quality of water to be stored in Lake St. Clair is of the same, or better, quality than the water now present.

The applicant's environmental assessment report stated, "This project would solve a problem that has plagued this area for well over 30 years, and which at times has appeared hopeless insofar as a satisfactory solution was concerned. It would be a fitting regard for the people of the area who have devoted so much of their time and money to protect and improve an environment of which they have become a part."

Commitment of Resources

We believe it important to emphasize that this project does not propose to commit any land resources which are not either presently being utilized for waste treatment purposes or already owned by the City. The land to be utilized in conjunction with the project will probably not be degraded in anyway, but should instead improve in productivity and fertility.

The land required to be zoned and reserved for airport use, can become available for a multiple purpose. Such an approach reduces the amount of land that must be dedicated for public use, and permits other lands to remain in private ownership and serve a productive purpose.

Alternatives Considered

Consideration was originally given to diverting water to the Buffalo River Watershed, a point approximately 4 miles northeast of Detroit Lakes. This plan also proposed the use of Lake St. Clair as a storage basin. During the summer months, it was planned to utilize the entire volume for crop irrigation along the route of the force main, through voluntary acceptance by the farmers. Existing drained marshes were to be restored for waterfowl habitats in the event the water could not be used entirely for irrigation. The marshes could thus act as storage ponds for further treatment and disposal of water through natural processes.

The area that was proposed to be used for this purpose is a large basin containing thousands of acres of sloughs and marshes that were drained during the 1920's and 30's, supposedly to provide productive agricultural land. The plan proved unsuccessful and destroyed some of the best waterfowl habitats in the nation. There are no recreational lakes in the Buffalo River drainage system that could be affected in the event any excess water was allowed to enter it. There were some objections to the plan, and it was subsequently abandoned.

The idea of utilizing only one of the three methods proposed was also considered, but because of climatic conditions and because of the increased operating costs, the plans to be utilized individually were dropped.

The estimates listed below are based on the construction cost of the facility which will be amortized over a period of 20 years with interest

figured at 6 percent. The cost per year is an average of yearly payments on principal and interest.

Treatment Method	Construction Cost	Daily Cost/MGD	Operation Cost/Year	Daily Cost/MGD	Total Cost/MGD
"A" Chemical Precipitation	$198,591	$192.78	$15,768	$187.82	$380.60
"B" Irrigation	$180,279	$174.74	$ 5,560	$ 66.22	$240.96
"C" Infiltration Basins	$143,000	$129.13	$ 5,460	$ 65.04	$194.17

The above estimate is based on the capacity for each method as being one-third of the present flow, a total of 258 acre feet per year, or 230,000 gpd. Waters from storage, other than treated wastewater, are considered incidental.

The total cost of treatment by the mixed process system per year at present flows of 764 acre feet per year is estimated to be $41,694 for amortization of construction costs, and $26,482 for operational costs, or a total of $68,176. The cost per year to treat the present flows solely by one of the proposed methods is estimated as follows:

Method "A" - Chemical Precipitation $93,440.00

Method "B" - Irrigation 58,400.00

Method "C" - Infiltration Basins 48,545.00

Though methods "B" and "C" are less costly than the combined method proposed, it must be remembered that due to climatic conditions, these systems could only be utilized on a seasonal basis, and much larger tracts of land would be required.

Public Objections to the Project

When the Pelican River Watershed was established, the law required that the overall plan and objectives of the district be prepared and submitted to the Minnesota Board of Natural Resources for approval prior to a public hearing. One of the principal objectives in the overall plan was to reduce the over enrichment and slow down the eutrophication of the recreational lakes. Consequently, the proposed project is of special concern to the Board of Managers of the Watershed District, and is heartily endorsed by them.

The project has also been endorsed by the City officials. The City of Detroit Lakes has been looking for a practical solution to the problem of advanced waste treatment for many years and feels that a practical solution has finally been designed.

Minnesota Statutes, Sections 105.41 and 105.42, provide that to make changes in lakes, streams, drainage ditches, etc., a petition must be presented to the County Board of Commissioners for approval of the charges proposed. Approval cannot be granted until a public hearing is held on the matter. The hearing cannot be held until the Commissioner of Natural Resources of the State grants a permit. All requirements of the law have been complied with and a public hearing was held on August 5, 1971. Following the hearing, the County Board of Commissioners voted unanimously to grant the permit.

Certain local concerns and objections to the project were raised during the hearing by citizens living in adjacent areas outside the site

boundaries. The concerns discussed were due in part to the natural anxieties raised about obtaining a fair price for property which must be acquired by the City.

Further local concerns have been due in part to a lack of understanding by individual citizens of the performance capability of the system. Specific aspects of local conceptual difficulties include:

1. Lack of understanding of how the groundwater system functions, and how the soils effectively reduce the phosphorous content of the water prior to its reentry into the groundwater.
2. Concern about potential odor and other nuisance problems, without being aware of the quality of the water.
3. Misinformation or misinterpretation of articles printed in magazines, newspapers, etc., which lead to such statements as "spray irrigation will not work" or "that two inches of water is saturation for this area."

The misunderstandings listed above were discussed and explained in detail to the public and most of the concerns seem to have been alleviated as a result of the explanations given.

Conclusions and Recommendations

Extensive algal blooms in Lake Sallie have become a major problem over the last several years. Many of the summer homes and lots surrounding

Lake Sallie are for sale as a result of the degradation. Lake Melissa, located immediately downstream from Lake Sallie and the channel connecting the two lakes are beginning to show signs of supporting extensive algal blooms. Detroit Lake, downstream from Lake Melissa is also showing signs of algal encrouchment. A method of treatment that can be utilized year around in the climatic conditions prevalent in Northern Minnesota is mandatory. The three process system proposed by this project is experimental in that it will determine the effectiveness of applying an identical effluent to three separate processes over a long period of time.

After weighing the alternatives considered, this statement reflects the view that the overall project is sound. The following considerations are strongly recommended:

- Orderly and expeditious implementation by the City of Detroit Lakes of the project proposed.
- Adequate provision in the specifications of the construction contract for soil erosion control during construction.
- Compliance with all applicable governmental (local, State, and Federal) regulations pertaining to site acquisitions.
- Inclusion of recreational and open space areas in planning uses for all lands embraced by this project.
- Conduct research as planned, in conjunction with the operation of the new facilities, including water quality monitoring,

evaluation of the performance of the treatment components, evaluation of the agricultural aspects, and an evaluation of the socio-economic and environmental impacts of the project on the environment.

- Direct monitoring of the waters of Lake St. Clair to insure continual safe water quality to maintain its value as a waterfowl refuge.
- Immediate implementation of an appropriate sewer use ordinance, providing for adequate industrial pretreatment facilities to maintain concentrated wastes at a subtoxic level.
- Utilization to the greatest extent possible of all plant life located on the treatment sites by transplanting to form buffer zones surrounding the sites which will be suitable aesthetically and as wildlife habitats.
- Utilization to the greatest extent practical of low profile, irrigation, and distribution equipment.
- Utilization of appropriate mosquito control practices. Weeds and brush growing on embankments will be removed routinely during the growing season, and the banks of Lake St. Clair will be sloped so as to reduce the growth potential of rooted acquatic plants.
- Implementation of a program for coordination between wastewater facility operators and appropriate airport personnel. The program will provide detailed records of any instances where the operations of the nutrient removal facilities were curtailed or modified in response to requests from airport authorities. Such records will be forwarded to EPA annually for a maximum of five years from the date the nutrient removal facilities are placed in operation.

TABLE NO. 1

WASTE TREATMENT FACILITIES
CITY OF DETROIT LAKES, MINNESOTA

STATISTICS ON THE SERVICE AREA

1. CENSUS DATA AND ESTIMATED FUTURE GROWTH

Year	Population	Per Cent Increase
1930	3,675	--
1940	5,015	Plus 36%
1950	5,787	Plus 13%
1960	5,946	Plus 3%
1970	6,352*	Plus 7%
1980 (Est.)	7,305	Plus 15%
1990 (Est.)	8,400	Plus 15%

*Includes population increase due to annexation during 1971.

2. INDUSTRIAL, COMMERCIAL AND INSTITUTIONAL WASTE PRODUCERS

Name	Classification
Swift and Company	Poultry Processing
King Coin	Laundry
Mighty Boy	Laundry
Dime A Time	Laundry
Kadletz	Commercial Laundry
St. Mary's Hospital	Hospital
Detroit Lakes Nursing Center	Convalescent Care
Emmanuel Nursing Home	Retirement Center
Washington School	Grade School
Lincoln School	Grade School
Rossman	Grade School
Holy Rosary	Parochial Grade School
Junior High School	School
Senior High School	School
Vocational Technical Institute	School

3. WATER SUPPLY

The service area is supplied water from three deep wells. The water delivered to the distribution system from this source each year and the number of customers is listed as follows:

Reproduced from best available copy.

Year	Gallons of Water Delivered to System	Number of Customers
1961	386,740,000	1,487
1962	327,405,000	1,499
1963	332,500,000	1,526
1964	322,123,000	1,546
1965	337,196,900	1,604
1966	353,978,000	1,644
1967	359,633,400	1,666
1968	330,264,700	1,670
1969	364,220,200	1,673
1970	340,828700	1,722

It is estimated that 90 per cent of the population receives service.

4. VOLUME OF WASTE METERED AT TREATMENT PLANT

Month	1968	1969	1970
January	23,872,300	26,570,193	23,376,900
February	21,732,200	20,537,900	20,784,600
March	23,431,700	21,426,646	25,173,300
April	25,106,700	27,623,700	25,580,400
May	27,800,700	23,606,000	27,324,800
June	27,140,800	23,318,600	31,897,300
July	30,312,800	28,584,200	34,228,600
August	27,647,300	27,647,300	32,380,600
September	24,149,900	24,149,900	28,396,400
October	28,931,100	26,198,000	29,164,000
November	31,765,300	25,784,565	27,284,600
December	23,056,000	26,042,400	25,874,200
TOTALS	314,986,800	301,511,404	331,467,900

It is estimated that 90 per cent of the population receives service, and that water and sewer service customers are essentially the same.

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5. WATER USED BY SWIFT AND COMPANY - 1970

Month	Gallons of Water Metered
January	3,594,250
February	3,882,750
March	3,178,500
April	2,903,250
May	4,646,250
June	3,594,750
July	6,630,750
August	8,875,500
September	10,587,750
October	9,898,500
November	10,575,000
December	9,489,750
TOTAL FOR YEAR	79,857,000

Water obtained by this industry through City meter reaches the sanitary sewer system.

6. WATER USED BY LAUNDRIES - 1970

Name	Gallons Per Year	Ave. Gals./Day (312 Days/Year)
King Coin	3,502,500	11,256
Mighty Boy	2,732,500	8,822
Kadletz	3,102,750	9,945
Dime A Time	908,250	2,911

7. WATER USED BY INSTITUTIONS

Name	Gallons Per Year	Ave. Gals./Day (365 Days/Year)
St. Mary's Hospital	5,725,500	15,686
Detroit Lakes Nursing Center	3,962,250	10,855
Emmanuel-Nursing Home	3,843,000	10,528

8. WATER USED BY SCHOOLS

Name	Gallons Per Year	Ave. Gals./Day (200 Days/Year)
Senior High	3,025,250	15,126
Junior High	2,298,750	11,494
Rossman	324,000	1,620
Washington	596,250	2,981
Vocational Tech.	2,188,500	10,943
Holy Rosary	1,162,500	5,812
Lincoln	540,700	2,703

Reproduced from best available copy.

CALCULATED FLOWS AND STRENGTHS OF WASTE
(Year 1971)

	DAILY FLOWS			DAILY B.O.D.		
	Minimum	Average	Maximum	Minimum	Average	Maximum
Domestic Waste	500,000	525,000	550,000	938	985	1,032
Swift & Company	--	300,000	500,000	-	988	1,647
King Coin Laundry	11,256	11,256	11,256	21	21	21
Mighty Boy Laundry	8,822	8,822	8,822	16	16	16
Kadletz Laundry	9,945	9,945	9,945	19	19	19
Dime A Time Laundry	2,911	2,911	2,911	5	5	5
St Mary's Hospital	15,696	15,696	15,696	31	31	31
Detroit Lakes Nursing Center	10,855	10,855	10,855	20	20	20
Emmanuel Nursing Home	10,528	10,528	10,528	20	20	20
Senior High School	--	15,126	15,126	-	28	28
Junior High School	--	11,494	11,494	-	22	22
Rossman Grade School	--	2,981	2,981	-	6	6
Vocational Technical School	--	10,943	10,943	-	20	20
Holy Rosary School	--	5,812	5,812	-	11	11
Lincoln School	--	2,703	2,703	-	5	5
Infiltration	50,000	50,000	50,000	-	-	-
TOTALS	620,013	994,072	1,169,072	1,070	2,197	2,903

TABLE NO. 2A

WASTEWATER TREATMENT PLANT
CITY OF DETROIT LAKES, MINNESOTA
WATER QUALITY DATA AT VARIOUS STATIONS OF THE TREATMENT SYSTEM
(Results are Averages for a Year 1970-71)

	Treatment Plant Inflow	Treatment Plant Effluent	Settling Pond Effluent	St. Clair Lake Overflow
FLOW (MGD)	0.926	0.926	.691	3.325
COLIFORM DENSITY				
Total MPN/100 ml	-	-	80	24
Fecal MPN/100 ml	-	-	Negative	Negative
5-Day BOD Mg/l	243	30	6.0	10.0
SETTLEABLE SOLIDS Mg/l ...	6.0	0.5	0	0
SUSPENDED SOLIDS Mg/l	234	31	11.0	8.0
DISSOLVED SOLIDS Mg/l	746	696	700.0	450.0
TOTAL SOLIDS Mg/l	980	727	711.0	458.0
TOTAL ALKALINITY Mg/l as $CaCO_3$	-	362	310.0	240.0
TOTAL HARDNESS Mg/l	-	360	304.1	296.0
CALCIUM HARDNESS Mg/l as $CaCO_3$	-	305	235.0	209.0
POTASSIUM Mg/l	-	14.8	15.8	7.2
SODIUM Mg/l	-	119	126.0	39.0
NITROGEN				
Ammonia Mg/l	-	2.48	0.83	Trace
Nitrite Mg/l	-	.41	0.119	0.123
Nitrate Mg/l	-	1.59	0.200	0.022
Kjeldahl Nitrogen Mg/l .	-	5.26	3.73	1.23
PHOSPHATES (PO_4)				
Ortho Mg/l	-	23.1	14.91	2.47
Total Mg/l	-	25.3	17.32	3.76
SPECIFIC CONDUCTANCE at 25° C	-	1191	1079	638
pH	-	7.8	8.5	8.6
DISSOLVED OXYGEN Mg/l	-	5.7	6.3	-

TABLE NO. 2B

Date 1971	1 Precipitation Inch	2 Influent Flow MG/d	Coliform Density Stab. Pond Effluent MPN/100 ml 3 TOTAL	4 FECAL	5 Plant Eff. D.O. Mg/l	6 Chlorine Used Lbs.	Residual Mg/l	7 Stab. Pond Eff. D.O. Mg/l	Settleable Solids 8 Raw Sewage Mg/l	8-A Stab. Pond Effluent Mg/l
Jan.		.758	320	Neg.	6.51	None	-	4.46	5.9	None
Feb.		.750	No test	-	7.3	None	-	3.50	6.2	None
Mch.		.877	No test	-	6.5	None	-	3.85	6.6	None
Apr.		.830	28	Neg.	6.1	None	-	6.6	6.0	None
May		.740	33	Neg.	5.6	None	-	12.76	6.2	None
June		.870	No test	-	4.6	None	-	8.6	5.9	None
July		.978	14	Neg.	3.8	None	-	7.5	6.3	None
Aug.		1.1	32	Neg.	4.3	None	-	7.4	6.4	None
Sep.		1.07	48	Neg.	4.6	None	-	5.3	6.2	None
Oct.		1.06	126	Neg.	5.9	None	-	5.9	5.9	None
Nov.		1.07	60	Neg.	6.4	None	-	7.3	5.0	None
Dec.		.99	56	Neg.	6.2	None	-	2.8	5.1	None
Ave.		.919	80	Neg.	5.7	None	-	6.3	6.0	None

TABLE NO. 2C

5 DAY B.O.D.

9 Raw Sewage		10 Stab. Pond Effluent		11 % Removal	10-A St.Clair Lake Eff.		11-A % Removal
Mg/l	Lbs.	Mg/l	Lbs.		Mg/l	Lbs.	
236	1492	8.4	53	96.5	-	-	-
223	1395	9.5	59	95.8	-	-	-
243	1777	8.6	63	96.5	2.1	-	-
231	1599	14.2	98	93.9	3.1	-	-
220	1368	5.8	36	97.4	4.6	-	-
230	1669	4.3	31	98.1	13.5	-	-
279	2275	5.7	46	98	24	-	-
287	2633	7.2	66	97.5	27	-	-
252	2248	7.2	64	97	15	-	-
270	2386	4.4	39	98	9.2	-	-
212	1951	2.2	20	99	3.0	-	-
229	1953	2.0	16.	99	2.4	-	-
244	1896	6.6	49	97.4	10.4	-	-

REMARKS

Results are averages for month.
7 to 8 samples per month were taken for five-day BOD, Suspended Solids, and Suspended Volatile Solids. Daily information was obtained for influent flow, pond effluent D.O., and stabilization pond D.O. 3 to 4 samples per month were taken for coliform density and effluent nutrients. Flow volume at stabilization pond & St. Clair outlet taken by U.S.G.S.

TABLE NO. 3A

	SUSPENDED SOLIDS							
	12		13		14	13-A		14-A
	Raw Sewage		Stab. Pond Effluent		% Remo-val	St. Clair Lake Eff.		% Remo-val
1971	Mg/l	Lbs.	Mg/l	Lbs.		Mg/l	Lbs.	
Jan.	201	1270	5.0	32	97.5	-	-	-
Feb.	224	1401	9.0	56	96.0	5.5	-	-
Mch.	260	1902	7.1	52	97.3	4.4	-	-
Apr.	219	1516	14.0	97	93.6	14.3	-	-
May	207	1288	11.8	73	94.3	14.4	-	-
June	227	1647	3.1	22	98.6	24.0	-	-
July	258	2104	3.6	29	98.6	38.0	-	-
Aug.	256	2311	3.6	33	98.5	66.0	-	-
Sept.	255	2274	3.5	31	98.6	49.0	-	-
Oct.	270	2387	4.4	39	98.0	28.0	-	-
Nov.	212	1951	2.2	20	99.0	11.0	-	-
Dec.	216	2014	2.2	19	99.0	4.0	-	-
Ave.	234	1839	5.8	42	97.7	23.5	-	-

TABLE No. 8

VOLATILE SOLIDS

15 Raw Sewage		16 Stab. Pond Effluent		17 % Removal	16-A St. Clair Lake Eff.		17-A % Removal
mg/l	Lbs.	mg/l	Lbs.		mg/l	Lbs.	
103	631	2.0	12.26	98.0	-	-	-
126	788	3.9	24.60	97.0	1.4	-	-
153	1119	4.1	30.60	97.3	1.9	-	-
146	1011	5.1	35.00	96.5	5.1	-	-
156	979	5.3	33.60	96.6	6.9	-	-
173	1270	1.6	12.60	99.0	13.0	-	-
218	1778	2.7	22.00	98.8	27.0	-	-
206	1390	2.3	21.60	99.0	47.0	-	-
203	1811	2.3	21.60	99.0	33.0	-	-
183	1618	2.4	21.0	98.7	18.0	-	-
176	1570	1.4	14.0	99.0	8.0	-	-
171	1523	1.2	11.0	99.0	2.3	-	-
168	1333	2.9	21.0	98.4	13.0	-	-

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TABLE NO. 8

EFFLUENT NUTRIENTS

18		19		18-A		19-A	
Stab. Pond Total Phos.		Stab. Pond Kjeldahl Nit.		St. Clair Lake Total Phos.		St. Clair Lk. Total Nit.	
Mg/l	Lbs.	Mg/l	Lbs.	Mg/l	Lbs.	Mg/l	Lbs.
4.2	-	-	-	-	-	0.71	-
-	-	7.89	-	3.39	-	2.89	-
-	-	-	-	3.50	-	-	-
-	-	-	-	0.50	-	2.80	-
3.85	-	-	-	0.41	-	1.60	-
2.25	-	-	-	0.99	-	-	-
1.33	-	-	-	0.68	-	2.60	-
2.35	-	-	-	0.36	-	2.20	-
1.90	-	-	-	0.65	-	1.50	-
2.50	-	-	-	0.50	-	1.70	-
1.89	-	-	-	0.40	-	1.25	-
1.45	-	-	-	0.43	-	1.10	-
1.99	-	7.89	-	1.07	-	1.84	

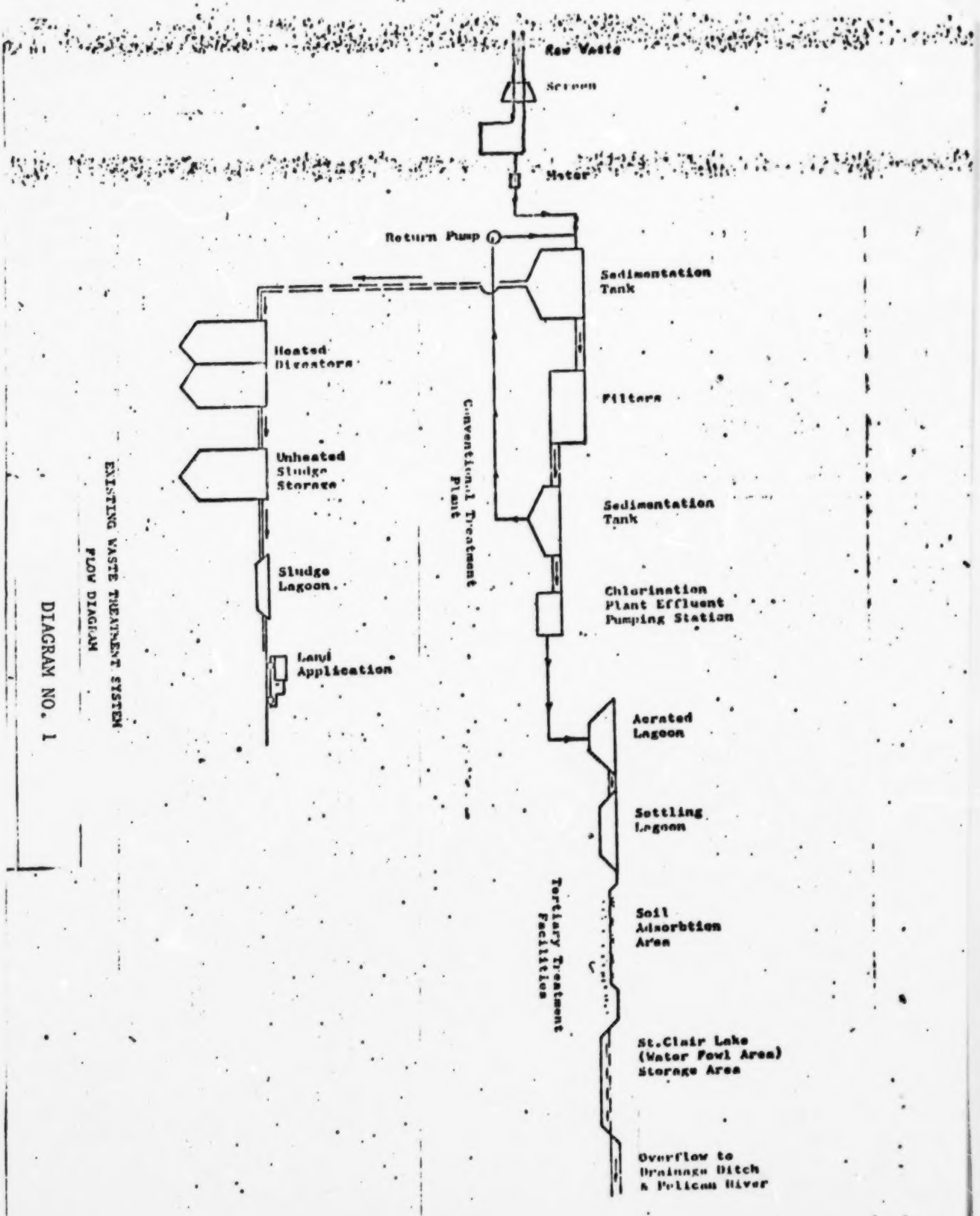

DIAGRAM NO. 1

EXISTING WASTE TREATMENT SYSTEM

FLOW DIAGRAM

TABLE NO. 4

SOIL WATER RELATIONSHIPS

(2) Description of Soils	(3) Representative Soils	(4) Thickness & Texture 1/ of Horizon or Layer (Inches)	(5) Max. Available Water (In./In.)	(6) Maximum Application Rate In./Hr. Bare	(6) Maximum Application Rate In./Hr. Cover	(7) Depth to be Irrigated (In.)	(8) 2/ Max. Available Water (In.)	(9) Water Depletion (%)	(10) Net Water Replaced (In.)	(11) Peak Water Use (In./Day)	(12) Irrigation Interval (Days)
Sandy soils, very shallow to gravel & sand. MAWC 3/ range from 1.0 to 1.5" to 12" depth. Irrigate only to gravel and sand.	Sioux	0-12 gls 12-48 s&g	.10	1.0	1.0	12	1.2	60	.72	.27	2.7
Sandy loams, shallow to sand & gravel. MAWC ranges from 2.0 to 3.0" to 18" depth. Irrigate only to sand and gravel.	Arville	0-6 sl 6-12 sl 12-18 sl 18-48 s&g	.14 .13 .11	0.6	1.0	12 18	1.6 2.3	50 50	.80 1.15	.27 .25	3.0 4.6
Dark-colored loamy soils. MAWC ranges from 5.5 to 7.0" to 30" depth.	Waukon	0-12 l cl 12-18 l cl 18-30 l cl 30-48 l cl	.21 .19 .17 .17	.5	1.0	12 24 30	2.5 4.7 5.7	40 40 40	1.00 1.88 2.28	.26 .23 .22	3.8 8.2 10.4

TABLE NO. 5A

MONTHLY INPUT AND OUTPUT OF WATER

PELICAN RIVER CHAIN OF LAKES ADJACENT TO WASTE TREATMENT FACILITIES

CITY OF DETROIT LAKES, MINNESOTA

U.S.G.S. Report - Typical Year 1969
Data in Acre Feet

Month	Sta. DS-3 St. Clair Lake Outlet	Sta. DS-4 Detroit Lake Outlet	Sta. DS-5 Lake Sally Inlet @ Musk. Lake	Sta. DR-2 Lake Sally Outlet
Oct.	242	226	287	...
Nov.	211	664	833	...
Dec.	197	748	934	...
Jan.	190	912	990	...
Feb.	250	1,260	1,800	...
Mar.	276	1,060	1,560	...
Apr.	1,033	4,060	4,790	...
May	562	2,040	2,740	...
June	310	346	710	...
July	233	376	577	...
Aug.	140	122	146	...
Sept.	85	1	12	...
TOTAL	3,729	11,810	15,380	17,952

Calculated Diversion Water (Based on 1969 Data)

Month	Diverted Water From St. Clair Lk.	Loss To System	Add to System Chem. Proc. Effluent
Oct.	99	143	21.5
Nov.	88	123	21.5
Dec.	98	99	21.5
Jan.	170	20	21.5
Feb.	171	79	21.5
Mar.	196	80	21.5
Apr.	672	361	21.5
May	366	196	21.5
June	179	130	21.5
July	162	71	21.5
Aug.	51	89	21.5
Sept.	46	39	21.5
TOTAL	2,298	1,430	258.0

Net loss of water to system.....1,172 acre feet.

TABLE NO. 5B

MINIMUM AND MAXIMUM FLOWS TO AND FROM LAKES
PELICAN RIVER WATERSHED

(Cubic Feet Per Second)

Lake	Maximum	Minimum
Sta. DS-2 Long Lake Outlet	6.9	0.0
Sta. DS-3 St. Clair Outlet	31.0	0.7
Sta. DS-4 Detroit Lake Outlet	110.0	0.0
Sta. DS-5 Muskrat Lake Outlet Lake Sallie Inlet	135.0	0.0
Sta. DS-6 Detroit Lake Inlet	158.0	0.3

TABLE NO. 5C

ELEVATIONS AT WELLS IN THE VICINITY OF THE DETROIT LAKES AIRPORT

DESCRIPTION	ELEV. TOP OF WELL	DEPTH TO WATER	COMPUTED WATER LEVEL
#1	1388.19	36.33	1351.86
#2	1383.63	32.28	1351.35
#3	1379.00	28.17	1350.83
#4	1368.58	17.96	1350.62
#5	1374.16	23.74	1350.42
#6	1364.45	13.87	1350.58
#7	1368.54	19.48	1349.06
#8	1355.76	8.42	1347.34
#9	1357.95	18.49	1339.46
#10	1378.41	24.43	1353.98
Long Lake W.L. 3.69 Gage Reading	Computed Zero of Gage - 1346.83	3.69	1350.52

(Note: Level established by using water level obtained near Airport.)

St. Clair Lake	Zero of gage.....	1331.14
	Gage Reading - 4.46	
	W.L. Elevation.....	1335.60

TABLE NO. 6A

MONTHLY INPUT AND OUTPUT OF WATER
TO
ST. CLAIR LAKE AFTER DIVERSION

(USGS Flow Data for Year Ending 9/30/69)
Quantities in Acre Feet

	Diverted Water (By Pass)					
Month	Sta. DS-1 W.B.Ditch No. 14	Sta. DR-1 E.B.Ditch No. 14	Sta. DS-2 Long Lake(Out)	TOTAL DIVERTED WATER	Sta. DS-3 St. Clair Lake(Out)	TOTAL RETAINED WATER
Oct.	24.00	62.02	13.00	99.02	242.00	142.98
Nov.	16.00	49.70	22.00	87.70	211.00	123.30
Dec.	2.00	40.70	55.00	97.70	197.00	99.30
Jan.	0.00	38.78	131.00	169.78	190.00	20.22
Feb.	0.00	36.00	135.00	171.00	250.00	79.00
Mar.	0.00	72.26	124.00	196.26	276.00	79.74
Apr.	237.00	148.55	286.00	671.55	1,033.00	361.45
May	67.00	77.11	222.00	366.11	562.00	195.89
June	18.00	59.20	102.00	179.20	310.00	130.80
July	11.00	62.48	89.00	162.48	233.00	70.52
Aug.	2.00	22.05	27.00	51.05	140.00	88.95
Sept.	7.10	39.23	0.00	46.33	85.10	38.77
TOTALS	384.10	708.08	1,206.00	2,298.18	3,729.10	1,430.12

*Loss of water if treated wastewater is removed.
**Estimated storage from 9/15 to 5/15 - 240 days.
***21.5 acre feet monthly to be treated by chemical precipitation for P. removal and diverted from St. Clair Lake.

TABLE NO. 6B

reated waste-water	Unaccounted for Water to St. Clair Storage	Wastewater to Storage 9/15-5/15 240 Days***	Monthly Input to St. Clair Lake	Water Removed to Soils from Storage	Accumulated Balance of Storage & Removal
71.30	71.78	49.70	121.48	....	121.48
61.40	61.90	39.90	101.80	....	233.28
61.40	37.90	39.90	77.80	....	301.08
63.40	(-45.18)*	43.90	(-1.28)	....	299.80
50.60	28.40	29.10	57.50	....	357.30
58.00	21.74	36.50	58.24	....	415.54
81.80	279.65	60.30	339.95	....	755.49
67.30	128.69	22.85**	87.20	127.08	715.43
58.00	72.00	....	72.00	237.40	550.03
74.90	(-4.38)*	....	(-4.38)	245.66	299.99
64.00	24.95	....	24.95	245.66	79.28
59.50	20.73	19.00**	39.73	119.20	00.00
773.40	698.18	341.15	974.99	975.00	....

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TABLE NO. 7

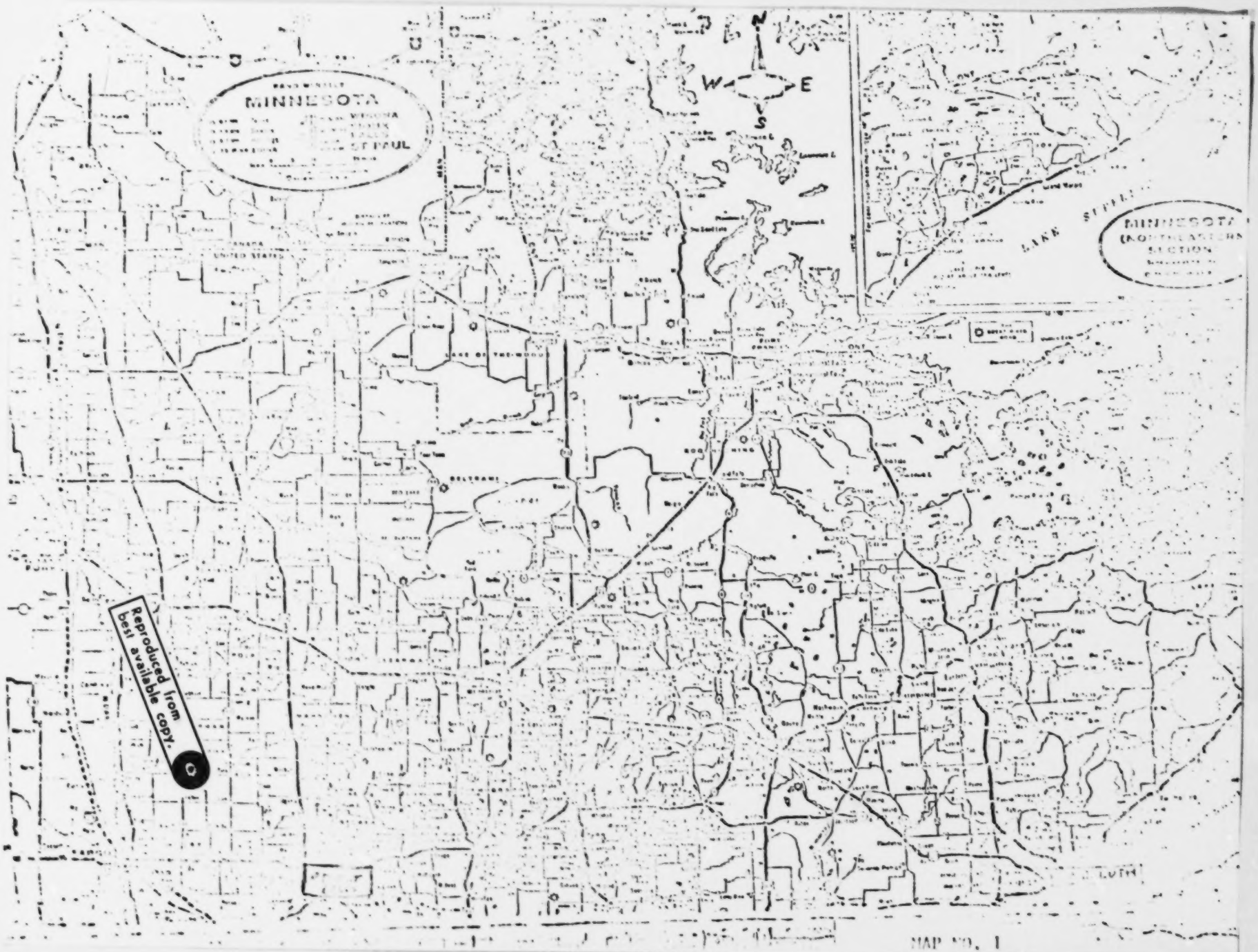
DATA ON LAKES
(Fish Lakes)

(From "A Biological Survey of Pelican River Watershed", Minnesota Department of Conservati
Division of Game and Fish, Spec. Publication No. 65)

Lake	Total Area (Acres)	Littoral Area (Acres)	Miles Shore-line	Max. Depth (Feet)	No. of Inlets	No. of Outlets	Development (1970 Est.)
Detroit Lake	3,083	1,895	14.2	82	3	1	26 resorts and motels with 282 rental units. 600 cottages & homes 1,000 boats
Muskrat Lake	67	64	2.0	18	2	1	1 home 1 boat
Lake Sallie	1,211	520	5.6	55	5	1	5 resorts 200 cottages 500 boats
Lake Melissa	1,831	935	6.9	43	2	1	8 resorts 450 cottages 1500 boats

DATA ON LAKES - (Westland Type - Waterfowl)

Lake	High Water Area (Acres)	Present Water Area (Acres)	Max. Depth (Feet)	Average Depth (Feet)	No. of Inlets	No. of Outlets
St. Clair	250	140	7.5	4.3	4	1


MINNESOTA
N
W
E
S
MINNESOTA
LAKE
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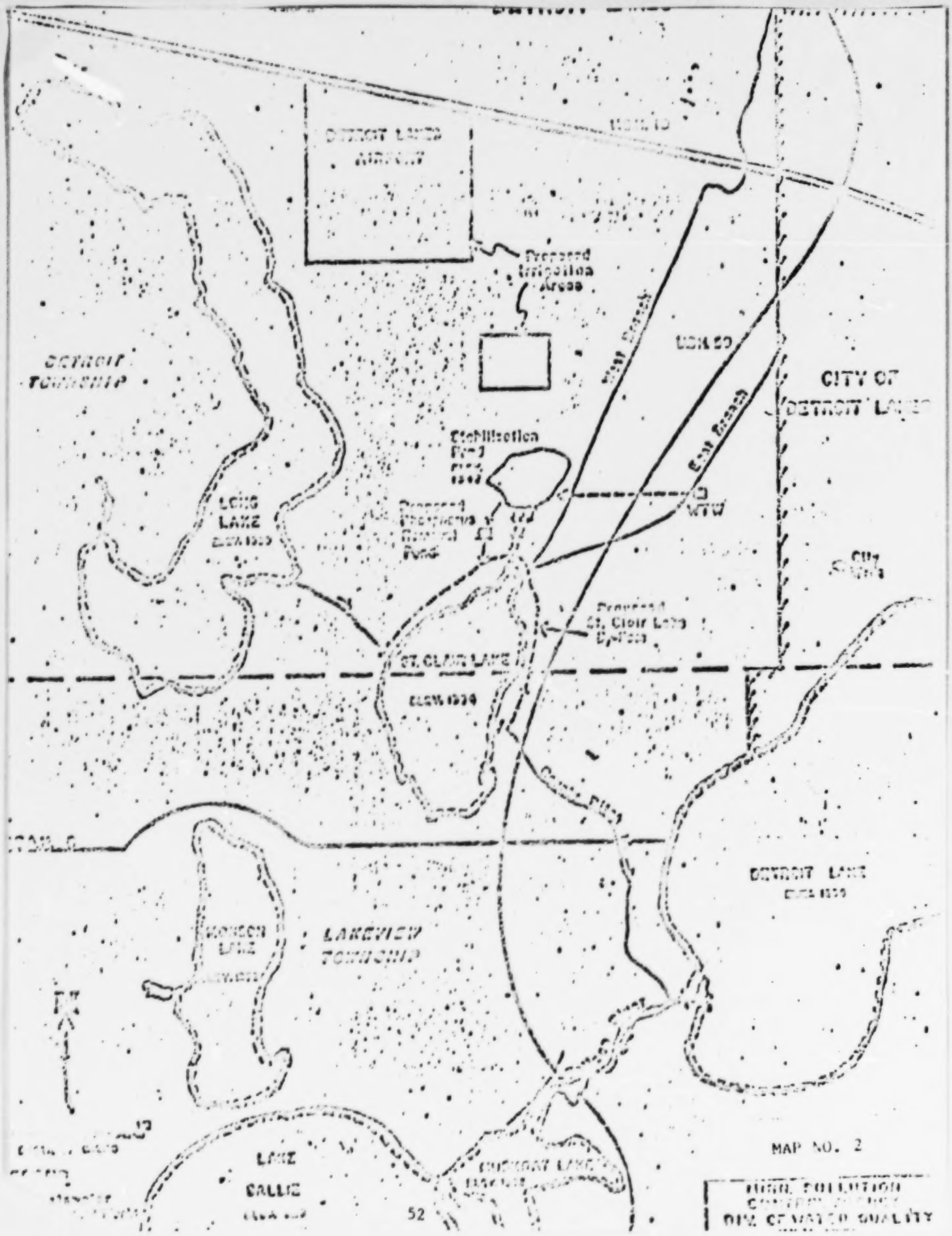
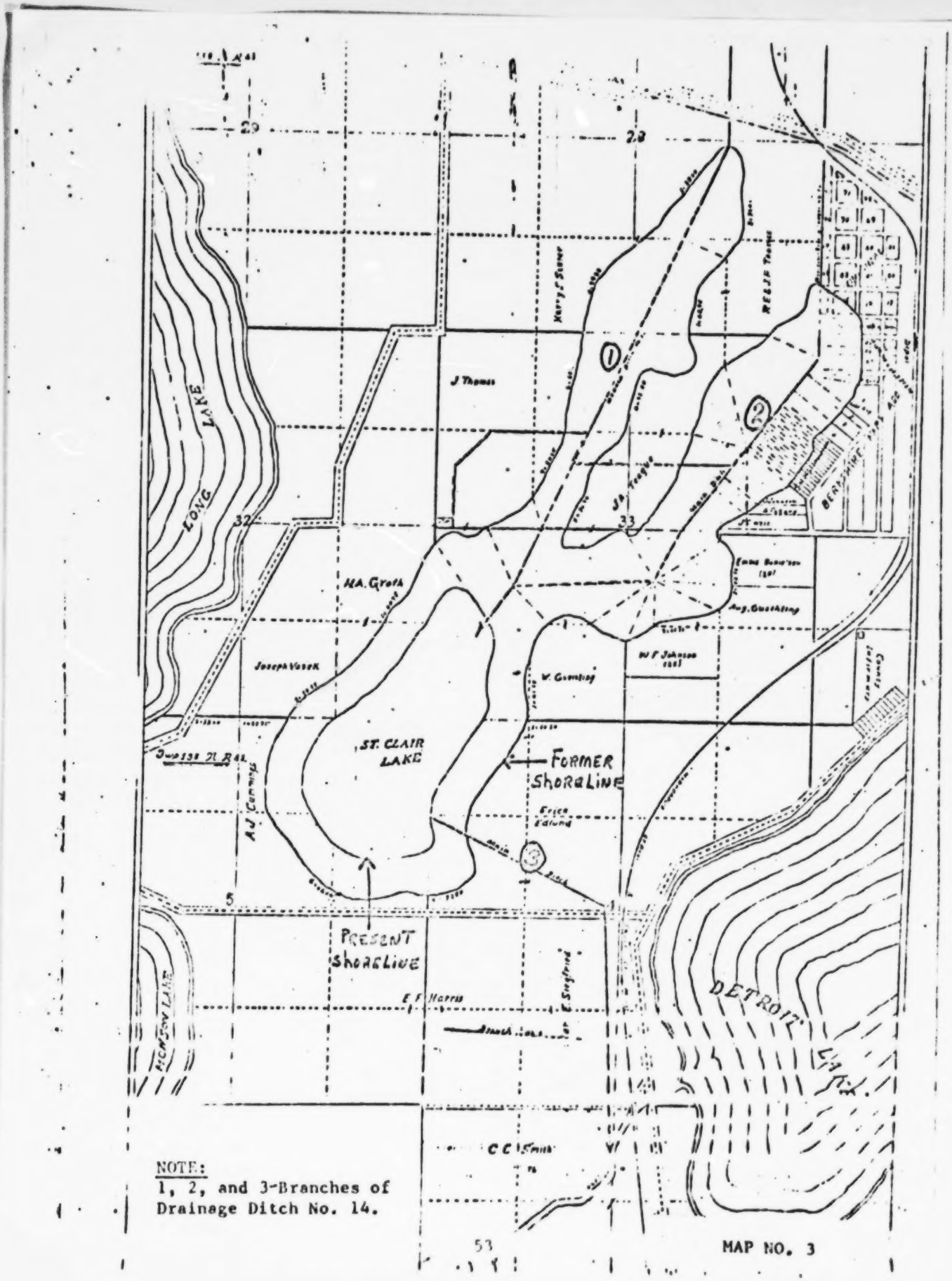
MAP NO. 1


DETROIT LAKES AIRPORT
Proposed Irrigation Areas
DETROIT TOWNSHIP
CITY OF DETROIT LAKES
Chlorination
LONG LAKE
Proposed Protective Control Fence
WTW
Proposed St. Clair Lake Dyking
ST. CLAIR LAKE
DETROIT LAKE
LAKEVIEW TOWNSHIP
LAKE SALLIE
MAP NO. 2
DIV. OF WATER QUALITY



NOTE:
1, 2, and 3-Branches of Drainage Ditch No. 14.

MAP NO. 3

DETROIT LAKES, MINNESOTA

WASTE TREATMENT FACILITIES
EXISTING AND PROPOSED

MAP NO. 4

DETROIT LAKES, MINNESOTA
VICINITY MAP

MAP NO. 5

LANDING FIELD
LAKE
CITY OF DETROIT
CITY OF DET LAKES
EDWARD BERGQUIST
BOB BERQUIST
R.W. WIRTZ
St Clair Dr.
CHARLES NASH
LLOYD C WATT
JOHN PUETZ
WILLIAM PUETZ
PAUL LIEN
DUANE LEE
JIM TAVES
FRANKLIN A GUNDERSON
Monroe Lake
PROPERTY OWNERS
Muskrat
ST. CLAIR LAKE BASIN
LAKE SALLIE
DETRO
32
27
4
3
10
9
56

MAP NO. 6

COMMENTARY AND RESPONSES
CONCERNING
DRAFT ENVIRONMENTAL IMPACT STATEMENT
ON THE
DETROIT LAKES WASTEWATER TREATMENT PROJECT

The material presented below is a listing of some of the more significant comments received from other Federal agencies concerning the Draft Environmental Impact Statement. The full text of all comments received on the Draft Environmental Impact Statement is attached.

1. Commentary:

The St. Clair Lake proposed storage basin appears to be adjacent to the right-of-way of T.H. 59. Consideration of the possible odorous and/or visual effect on the traveling public using T.H. 59 may be worthy of further review.

Response:

The City of Detroit Lakes now operates a mechanically aerated oxidation pond in the immediate vacinity which is a part of the existing waste treatment system. The existing oxidation pond is adjacent to State Highway No. 59 right-of-way, and the pond's appearance is not unattractive.

2. Commentary:

The proposed "Spray Irrigation Area No. 2" appears to be in the vacinity of T.H. 10 right-of-way. The possibility of spray being carried by wind currents onto the roadway does exist. The resulting effect on the traveling public would seem worthy of additional consideration.

Response:

Fixed low-head equipment will be utilized so as to minimize the amount

of spray which could be carried across the roadway. In addition, it should be noted that the irrigation water has a very low coliform count and organic content.

3. Commentary:

An airport master plan is now in progress at the Detroit Lakes Municipal Airport. Close coordination between the nutrient removal project and the airport consultant is suggested.

Response:

Planning for both the airport and the wastewater treatment facilities have been, and will continue to be, coordinated. Plans for the expansion of the airport are presently nearing completion, and it has been determined that the existing NW-SE runway which is presently 3,400 feet in length will remain the only major runway on this airport. Plans for the wastewater treatment facilities do make allowance for a possible ultimate runway length of 5,200 feet. Land for a clear zone of 100' X 1,750' X 2,500' has already been acquired at the end of the future 5,200 foot runway.

4. Commentary:

Will airport runoff be a problem in the design of the nutrient removal facilities?

Response:

The representative soils in the airport area are the Sioux and Arvilla. These soils are capable of utilizing an inch of water per hour. There have been no problems with drainage from the airport in the past, but the

proposed construction at the airport does contemplate a pipe drain to a drainage ditch, principally to provide for spring runoff when soils are frozen.

5. Commentary:

The existence of the proposed project's facilities adjacent to and on airport property may adversely sensitize the social and economic development of the airport facility.

Response:

At the present time, an adverse sensitization is not foreseen. The proposed vegetative cover for the infiltration basins will be Reed Canary Grass, and the area should assume an appearance not unlike that of a golf course.

6. Commentary:

The use of airport land for non-aviation purposes will be a matter for discussion with the Airport District Office.

Response:

The proposed irrigation area is now being farmed in grains. The City has communicated with the Minnesota Department of Aeronautics, and the Department indicates that their principal concern is meeting the FAA requirements from AC 150/5330-2B in respect to objects near the VOR, which would affect its operation. The structures proposed for the nutrient removal facilities should not affect the operation of the airport's VOR operation.

7. Commentary:

The compatability of the proposed spray irrigation facilities with normal airport operation was questioned by representatives of the Federal Aviation Administration (FAA) and the Minnesota Department of Aeronautics (MDA).

Response:

Regional EPA staff initiated a meeting between representatives of the City and all other concerned agencies. As a result of this meeting and other similar meetings initiated by City representatives themselves, both FAA and MDA withdrew their objections to the project. The foregoing notwithstanding, however, it does not appear possible, at present, to completely eliminate the possibility that certain incompatabilities between the needs of nutrient removal and airport operation could arise in response to unforeseeable circumstances.

In recognition of the above, the Council of the City of Detroit Lakes, Minnesota, has agreed to move, solely at the City's expense, the proposed spray irrigation nutrient removable facilities in the unlikely event that any irremediable difficulties should arise at any time in the future. In addition, a study will be made of the operations of the proposed spray irrigation facilities and their relationship to the activities of the Detroit Lakes-Becker County Airport so as to delineate the feasibility of providing for both nutrient removal mechanisms and airport expansion capacity at one and the same time.

GSA FPMR (41 CFR) [illegible]

UNITED STATES GOVERNMENT

Memorandum

TO : R. J. Schneider, Acting Regional Administrator, Environmental Protection Agency, Chicago, Ill.

DATE: July 17, 1972

FROM : District Chief, WRD, USGS
Okemos, Michigan

SUBJECT: Draft Environmental Impact Statement Concerning the Detroit Lakes Wastewater Treatment Project (Federal Sewage Treatment Works Construction Grant C270687)

I have received the subject statement and your request for comment. As this project lies outside the Michigan district, I am forwarding the statement to Charles R. Collier, District Chief, U. S. Geological Survey, St. Paul, Minneapolis, with a request that he provide you with any comments he might have.

T. Ray Cummings

T. Ray Cummings

TRC/mew

EPA ... 1972
... 12:05 PM '72
REC'D

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

United States Department of the Interior

GEOLOGICAL SURVEY
Rolla, Missouri 65401

July 17, 1972

Mr. R. J. Schneider
Acting Regional Administrator, Region V
Environmental Protection Agency
1 North Wacker Drive
Chicago, Illinois 60606

Dear Mr. Schneider:

The Water Resources Division of the Geological Survey is responsible for informal review of draft environment impact statements.

We are therefore forwarding to that Division the statement concerning the Detroit Lakes Wastewater Treatment Project (Federal Sewage Treatment Works Construction Grant C270687) prepared by the Region V Construction Grants Branch, Division of Air and Water Programs. You may expect a reply from District Chief Charles R. Collier, whose office is located at 1033 Post Office Building, St. Paul, Minnesota 55101.

Sincerely yours,

A. C. McCutchen
Central Region Engineer
Topographic Division

JUL 19 12 02 PM '72

62

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
1210 U. S. POST OFFICE & CUSTOM HOUSE
ST. PAUL, MINNESOTA 55101

IN REPLY REFER TO

NCSED-PB

21 July 1972

SUBJECT: Draft Environmental Impact Statement Concerning the Detroit Lakes Wastewater Treatment Project (Federal Sewage Treatment Works Construction Grant C270687)

TO: Mr. R. J. Schneider
Acting Regional Director
Construction Grants Branch
Division of Air and Waters
Program - Region V
Federal Environmental Protection Agency
Chicago, Illinois 60606

1. Reference is made to your letter of 13 July 1972 inclosing a draft copy of the subject environmental impact statement.

2. The statement has been reviewed and it appears to cover adequately the aspects of the environment which are affected by the proposal and which fall within our purview.

Arthur E. Williams
ARTHUR E. WILLIAMS
Major, Corps of Engineers
Acting District Engineer

Copy furnished (10 copies)
Mr. Timothy Atkeson
General Counsel
Council on Environmental Quality
Executive Office of the President
722 Jackson Place NW
Washington, D.C. 20506

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
316 North Robert Street, St. Paul, Minnesota 55101

R. J. Schneider, Actg. Regional Director
Environmental Protection Agency
Region V
1 North Wacker Drive
Chicago, Illinois 60606

July 28, 1972

Dear Mr. Schneider:

The draft environmental impact statement for the Detroit Lakes Waste-Water Treatment Works Construction Grant C270687 in Becker County, that was addressed to Harry M. Major on July 13, 1972, has been reviewed by the Soil Conservation Service.

We were happy to read the Soil Conservation Service had been consulted in regard to the suitability of the soils for absorbing the effluent. The statement could be strengthened by more detail on how wind and water erosion will be controlled on the area to be disturbed during construction. The use of Lake St. Clair as a holding basin raises some questions as to the possible effect on all types of wildlife in and around it. The statement leaves some doubt in our mind as to whether enough study has been made of the possible consequences.

We appreciate the opportunity to review and comment on this proposed project.

Sincerely,

Harry M. Major
State Conservationist

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

GREAT LAKES REGION
2300 EAST DEVON AVENUE
DES PLAINES, ILLINOIS 60018

'72 AUG 3 PM 3:30

MGT. BR... SAB

1 AUG 1972

Mr. R. J. Schneider, Acting
Regional Administrator
U.S. Environmental Protection Agency,
Region V
1 North Wacker Drive
Chicago, Illinois 60606

Dear Mr. Schneider:

The draft environmental statement for the proposed Detroit Lakes Wastewater Treatment Project (Federal Sewage Treatment Works Construction Grant C270687), Detroit Lakes, Minnesota, was received by the Great Lakes Regional Office of the Federal Aviation Administration for review and comment.

The Federal Aviation Administration has reviewed the draft environmental statement and has the following comments:

1. An airport master plan is now in progress at the Detroit Lakes Municipal Airport, Detroit Lakes, Minnesota. The purpose of the plan is to make recommendations for airport development. We suggest close coordination between your project and the Detroit Lakes Municipal Airport consultant.

2. Being that the history and background developed from your draft E.I.S. will be similar to that needed for the draft E.I.S. to be developed in airport master plan, we suggest the data be available to the airport sponsor's consultant.

3. If the NW/SE runway is extended, will this affect the location of your proposed Irrigation Ponds? Although the master plan is not complete, the current project plans are to extend the NW/SE runway from 3400' to 4500' in the southeast direction. Ultimate plans will probably extend this runway to the southeast in excess of 5200'.

4. Will airport runoff be a problem in your hydrologic design? With an increase of runway pavement and the relatively flat airport areas, additional runoff in the form of larger flow rates and increased storm water quantities must be accommodated.

5. At the present time the Detroit Lakes Municipal Airport is served by the 3rd level air carrier on a regular basis. The aesthetic and visual effects are important to those persons being served. The existence of the proposed project adjacent to and on airport property may adversely sensitize the social and economic development of the airport facility.

6. The use of airport land for non-aviation purposes will be a matter that will have to be resolved with our Airport District Office, as part of their Compliance Program.

7. A request for an airspace determination as to the type of structures proposed and their location will have to be filed with our regional Air Traffic Division.

We are pleased to have been offered the opportunity to comment on this statement.

Sincerely,

Donald R. Stockdale

DONALD R. STOCKDALE
Acting Chief, Planning Branch, GL-611

TO : Regional Administrator, Region 5, Federal Environmental Protection Agency, Chicago, Ill. 60606

DATE: August 8, 1972

ATTN:

FROM: Regional Director, Region 3, Bureau of Sport Fisheries and Wildlife, Twin Cities, Minnesota

SUBJECT: Comments on Draft Environmental Impact Statement for the Detroit Lakes Wastewater Treatment Project, Minnesota (Federal Sewage Treatment Works Construction Grant C270527)

This is in response to Mr. R. J. Schneider's memorandum of July 13 requesting our review of the subject Impact Statement. Our comments follow.

Living Resources

On page 23 the word "habitat" would be better than "refuge" in both paragraphs. "Refuge", when used in relation to wildlife, generally refers to an area closed to hunting. "Habitat" means the multitude of environmental factors needed by wildlife to provide them a place to live and reproduce. So far as we know the irrigation site is not closed to hunting and we know that duck hunters use Lake St. Clair.

We would anticipate a change in the wildlife species using the irrigation site because the vegetation, moisture conditions, and soil fertility will probably be different. The wildlife species presently using the irrigation site will in all probability cease to exist. Relocation of wildlife species normally does not occur since habitats to which they might go are already saturated to their carrying capacity.

Lake St. Clair is valuable to waterfowl and furbearers. With the existing sewage lagoon it offers ducks needed breeding and migration habitat. In addition, the sewage lagoon is closed to the public and in certain respects acts as a refuge.

Commitment of Resources

On page 26, we are unable to determine whether or not Lake St. Clair is meandered. If it is, it is state property.

General

The following are comments of a general nature regarding waterfowl production potential as it relates to the total project.

Sewage ponds are often used heavily by breeding and migrating waterfowl. The pond just north of Lake St. Clair has a history of good duck production. To make the best use of existing and proposed ponds we suggest that nesting habitat

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to prevail in the immediate area. A 40 acre block of tame grassy and herbaceous cover in the general area would be excellent and it should be no more than one-half mile from the ponds. Anything smaller than 40 acres would still be worthwhile but of less value to wildlife. Such cover blocks will do much to enhance the area for upland nesting ducks such as mallards, teal, pintails and other upland wildlife species.

Marsh edge and matted cattail and bulrush already in Lake St. Clair provide nesting cover for divers such as canvasback and redheads.

Water level fluctuation during nesting can be a detriment to diving duck nesting success.

Waterfowl management techniques not in conflict with the primary purpose of treating sewage would be of public benefit and would make the total operation a multi purpose project.

Historically wood ducks nested near the existing pond but have ceased since the nesting trees were removed. The city of Detroit Lakes is now considering erecting wood duck houses. We encourage this.

Charles A. Heusdens

FORM FHWA-1211A (REV. 4-00)

UNITED STATES GOVERNMENT

Memorandum

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

TO : R. J. Schneider
Acting Regional Administrator
Region V
Federal Environmental Protection Agency
Chicago, Illinois 60606

DATE: August 11, 1972

In reply refer to:

FROM : W. W. Pryhofer
Division Engineer
5-21.43 St. Paul, Minnesota

SUBJECT: Draft Environmental Impact Statement Concerning the Detroit Lakes Sewage Treatment Project (Federal Sewage Treatment Works Construction Grant C27[illegible]7)

We appreciate receiving and being given the opportunity to review and comment on the subject environmental impact statement.

We have completed our review of the statement and offer the following comments:

1. The St. Clair Lake proposed storage basin appears to be adjacent to the right-of-way of T.H. 59. Consideration of the possible odorous and/or visual effect on the traveling public using T.H. 59 may be worthy of additional review.

2. The proposed "Spray Irrigation Area No. 2" appears to be in the vicinity of T.H. 10 right-of-way. The possibility of spray being carried by wind currents onto the roadway does exist. The resulting effect on the traveling public would also seem worthy of additional consideration.

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69

BUY U.S. SAVINGS BONDS REGULARLY ON THE PAYROLL SAVINGS PLAN

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS
ST. PAUL, MINN. 55101

August 9, 1972

Mr. R. J. Schneider
Acting Regional Administrator
Construction Grants Branch
Division of Air and Water Programs
Region V
Federal Environmental Protection Agency
Chicago, Illinois - 60606

In reply refer to:
Draft Environmental Impact
Statement Concerning the Detroit Lakes
Wastewater Treatment Project
(Federal Sewage Treatment Works
Construction Grant C270687)

Dear Mr. Schneider:

The Minnesota Highway Department has no comments to offer on the subject statement.

Sincerely,

Ray Lappegaard

Ray Lappegaard
Commissioner of Highways

RECEIVED
AUG 15 AM 10:28
ENVIRONMENTAL PROTECTION AGENCY

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

GREAT LAKES REGION
2300 EAST DEVON AVENUE
DES PLAINES, ILLINOIS 60018

DATE 25 September 1972

IN REPLY REFER TO AGL-610

SUBJECT Detroit Lakes/Becker County Airport, Detroit Lakes, Minnesota Wastewater Disposal System

TO Environmental Protection Agency
1 North Wacker Drive
Chicago, Illinois 60606

Attn: Mr. Donald Wallgren:

The enclosed supporting material is hereby forwarded to you as confirmation for the telephone conversation with your office on 12 September 1972.

The FAA no longer objects to the proposed development as was first proposed on 26 July 1972.

James F. Popp

JAMES F. POPP
Chief, Planning Branch, AGL-610

Enclosure

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

GREAT LAKES REGION
MINNEAPOLIS OFFICE
6301 34TH AVENUE SOUTH
MINNEAPOLIS, MINNESOTA 55450

DATE: 13 September 1972

IN REPLY REFER TO: AGL-MSP-600

SUBJECT: Detroit Lakes/Becker County Airport, Detroit Lakes, Minnesota
Wastewater Disposal System

TO: AGL-600
Attn: AGL-610

This confirms and supplements the telephone conversation with your office on 12 September 1972 in which we recommended that the 26 July 1972 letter to EDA be amended to show that FAA no longer objects to the proposed development.

Copies of the construction drawings for the three methods of wastewater disposal were received on 7 September and were reviewed by this office. A meeting on 12 September 1972 with the Minnesota Pollution Control Agency, State Board of Health, City and airport representatives, Windsor Larson, Consulting Engineer, Minnesota Department of Aeronautics, and Donald Stockdale - FAA, developed the following information to confirm our recommendation:

The Airport Commission, City and Public Utilities Board have been working closely together to develop this pilot project.

This test project is expected to develop guidelines for use throughout the area. It is expected to demonstrate to farmers that use of treatment plant wastewater is feasible for farm crops also.

Effluent from the treatment plant will be stored in Lake St. Clair until needed for irrigation. Water used on airport will be essentially lake water with slightly higher phosphate and sodium content. Water will be sprayed on airport crops only by a fulltime City employee and under strict control conditions monitored by local health authorities. Water will be sprayed only during growing season.

Only 1/30th of area is to be sprayed at any one time. During periods when wind or other atmospheric conditions may adversely affect airport, spraying near runways will be discontinued. Spraying will not be needed during wet weather.

Water will be delivered to sprayheads in plastic or transite pipes. Brass sprayheads, 30" to 36" above ground, will spray a radius of 70 feet. Spray will be droplets, squirted in an arch 20' to 25' above ground. Spray will rotate completely in 3 to 4 minutes. Rate of application will be up to 3/10 inch per hour. Sprayheads will be located at least 200 feet from runway centerline or VOR (or any other distance specified by the airport commission). Watering will be controlled to avoid saturation.

Bluegrass hay will be harvested from irrigated area. Bluegrass has high sodium tolerance. Phosphates from wastewater will be used up and removed in hay cuttings. Area will have appearance of hay pasture.

Infiltration basins will be constructed with dikes 2 to 3 feet high. Basins will be periodically flooded to depth of 2 to 3 inches with 12-inch maximum. Area will be treated like a rice paddy. Brome and canary grass hay will be harvested.

Fencing to protect the hay crop will also serve the airport. Fencing, sprayheads, and control should discourage snowmobiling.

Specific response to FAA's questions are:

1. Infiltration ponds and irrigation system are to be designed for airport development shown on the proposed revision to the ALP. Since construction of basins and field will not start until next summer, redesign is possible if necessary.

2. Airport runoff should not be affected by irrigation or infiltration basins. Spraying will not cause runoff. Spraying will cease during wet weather. Ground water level under runway should not be affected because of rolling terrain. Moisture in excess of that needed for crops will percolate through the granular soil rather than running off.

3. Esthetic and visual effect will be the same as a hay pasture.

4. The use of airport land for nonairport purposes will be monitored by FAA ADO. The draft of the proposed lease will be submitted to MDA and the ADO for review and approval prior to execution. The Airport Commission assured the group that the lease would establish the airport use as dominant and would provide for recapture of land when needed.

5. The structures, dikes, sprayheads, spray operation, have been reviewed by FAA and found to be unobjectionable. Because of terrain differential of 15 to 20 feet, treatment plant structures are not covered by FAR Part 77.

Specific response to MDA's additional questions are:

1. Spraying will be discontinued when operation adversely affects the airport.

2. No damage to runway is expected due to excess moisture from irrigation. Water table should not increase. Spray should not be within 130 feet of runway centerline.

3. No human wastes are to be sprayed. Therefore, no odor problems should develop.

4. Residue from chemicals in spray irrigation water should be used up in hay harvesting. No corrosive powder residue is expected.

5. Nuisances such as insects, worms, birds, etc. are not expected. Rate of watering and procedure of harvesting crops will be controlled so no nuisance develops.

for EDGAR P. VIE
Chief, Airports District Office

SEATTLE, WASH. 11 AM '63